

Figure 1 A

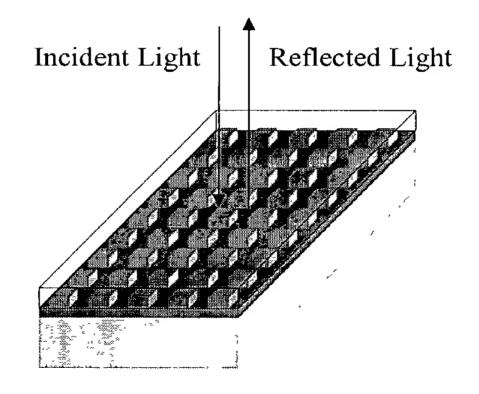


Figure 1 B

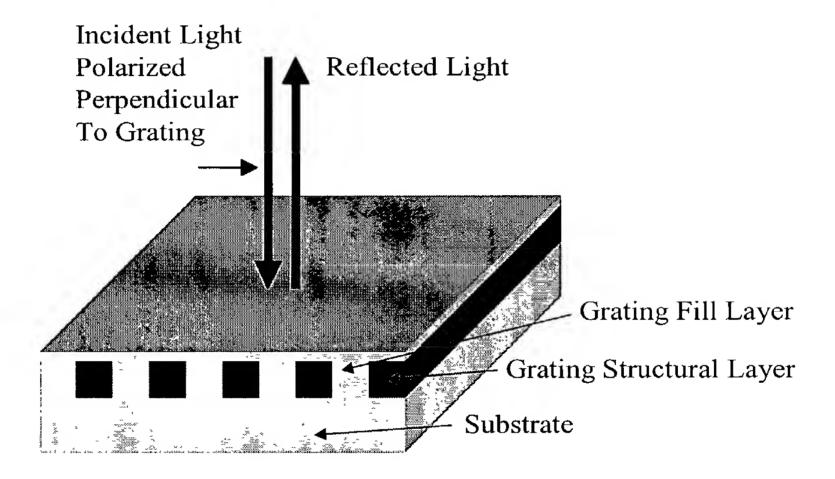


Figure 2

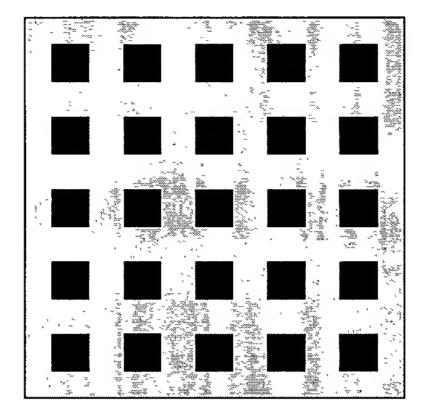


Figure 3A

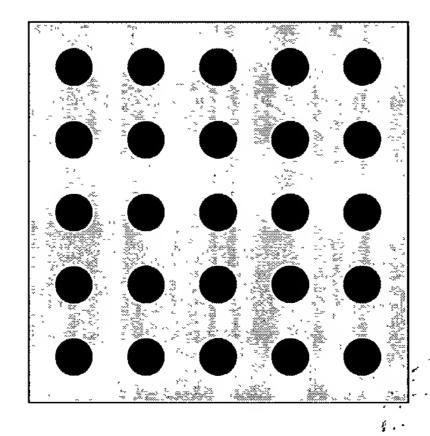


Figure 3B

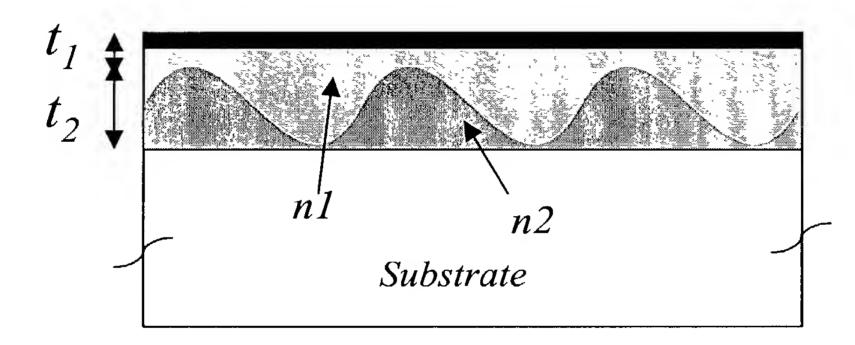


Figure 4



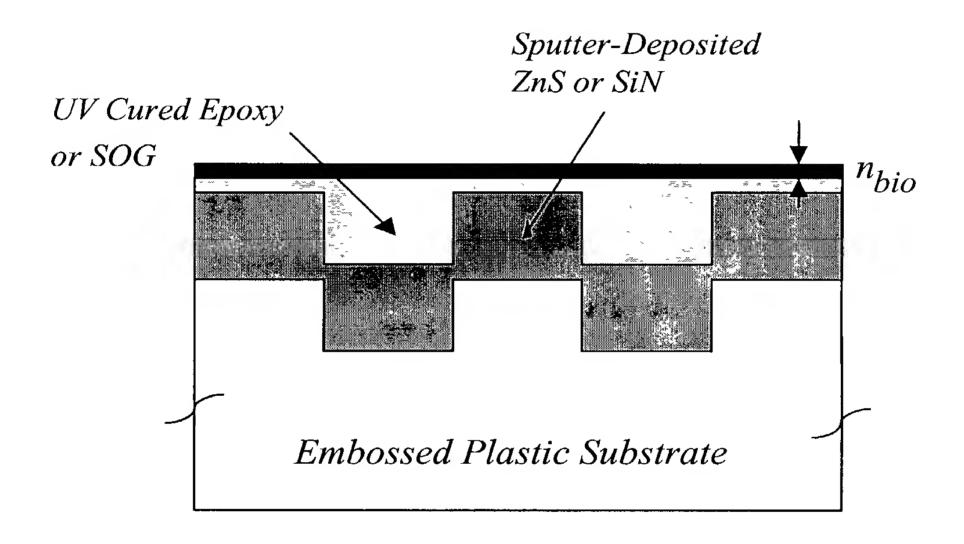


Figure 5

>Sulfo-succinimidyl-6-(biotinamido)hexanoate (Sulfo-NHS-LC-Biotin) •Streptavidin / avidin then biotinylated molecule

▶N,N'-disuccinimidyl carbonate (DSC); •-NH₂, non-cleavable

➤ Dimethyl pimelimidate (DMP); •-NH₂, non-cleavable

➤ Dimethyl 3,3'-dithiobispropionimidate (DTBP); •-NH₂, cleavable

Amine

➤1-Ethyl-3-(3-Dimethylaminopropyl)carbodiimide Hydrochloride (EDC) and N-Hydroxysulfosuccinimide (Sulfo-NHS); • -COOH

➤ Sulfo-succinimidyl 6-[a-methyl-a-(2-pyridyl-dithio)toluamido] hexanoate (Sulfo-LC-SMPT); •-SH, cleavable

➤N-(B-Maleimidopropyloxy)succinimide ester (BMPS)

• -SH₂, non-cleavable

➤ Sulfo-succinimidyl 4-[N-maleimidomethyl)cyclohexane-1carboxylate (Sulfo-SMCC); •-SH, non-cleavable

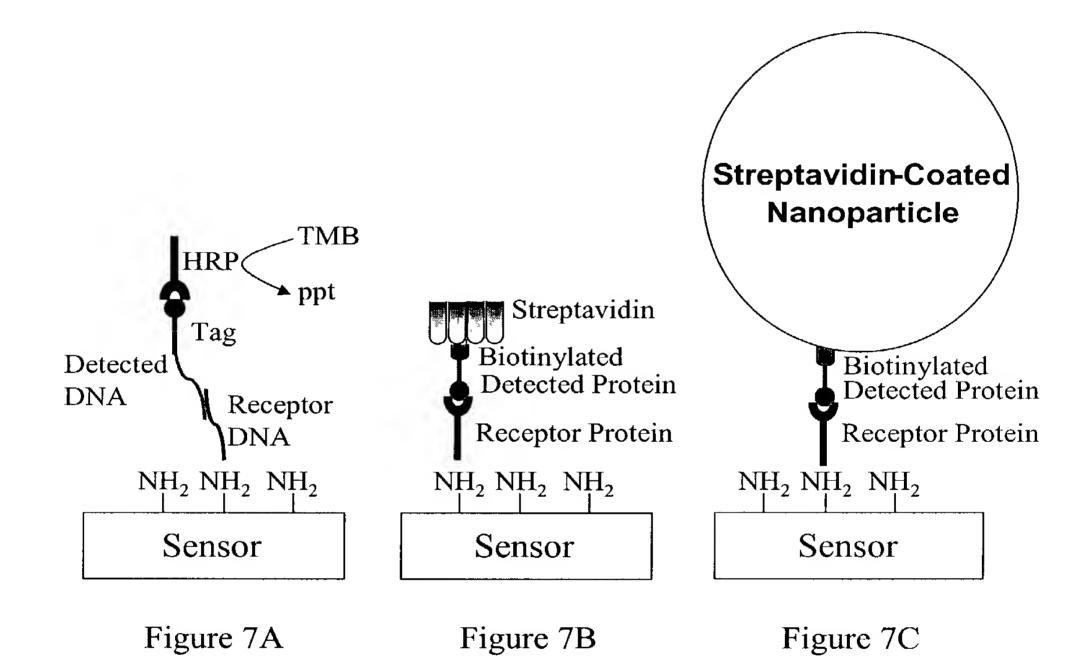
Aldehyde

> Directly with aldehyde or first amino then aldehyde • -NH₂

Ni(II)

>Using Nitrilotriacetic acid (NTA) group, which forms a chelate with Ni(II)

• His-tagged molecules





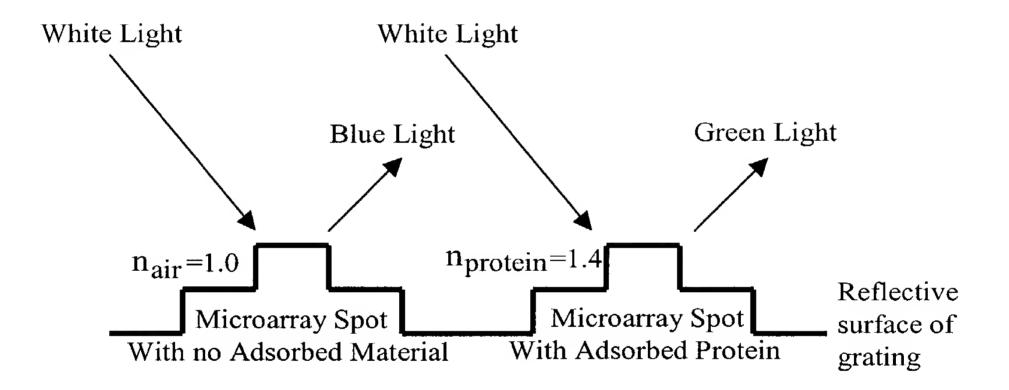


Figure 8



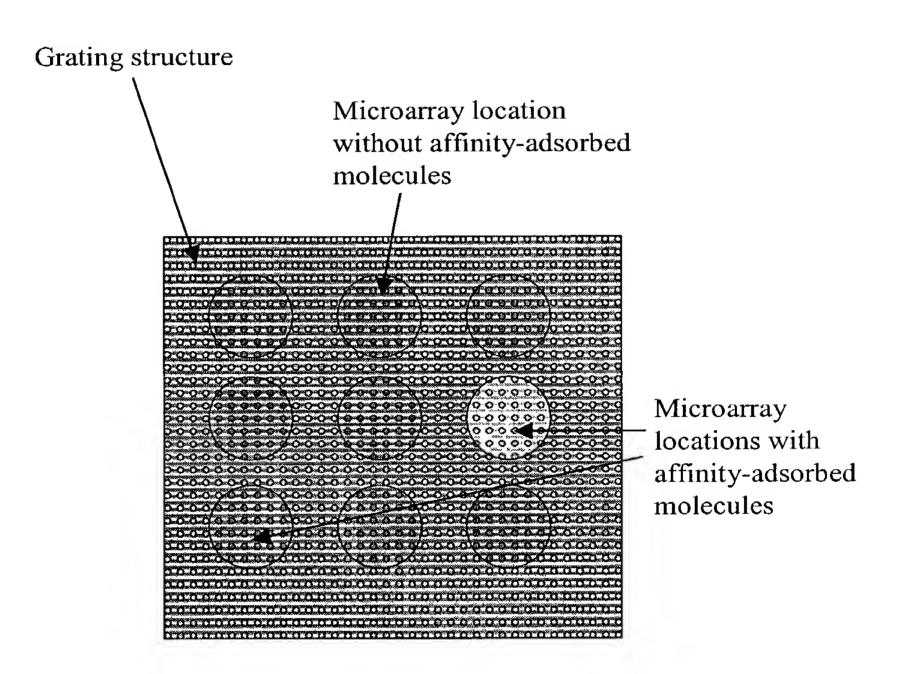


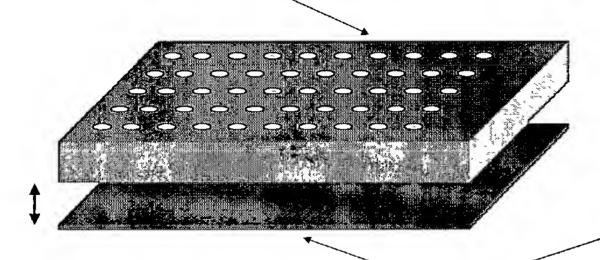
Figure 9



□ Microtiter plate

Microarray slide

Plastic bottomless microtiter plate. Holes in plate are open from top to bottom





Resonant reflection biosensor surface

Figure 10A

Figure 10B

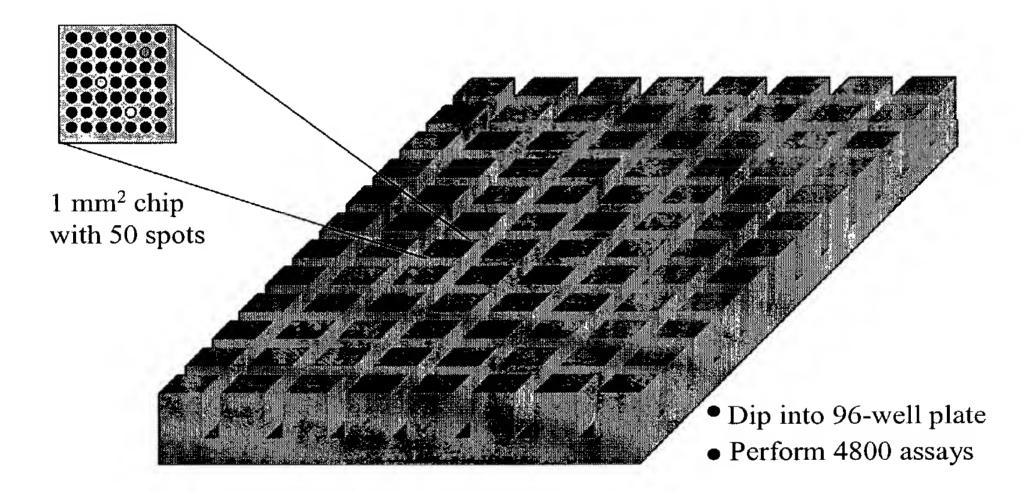


Figure 11



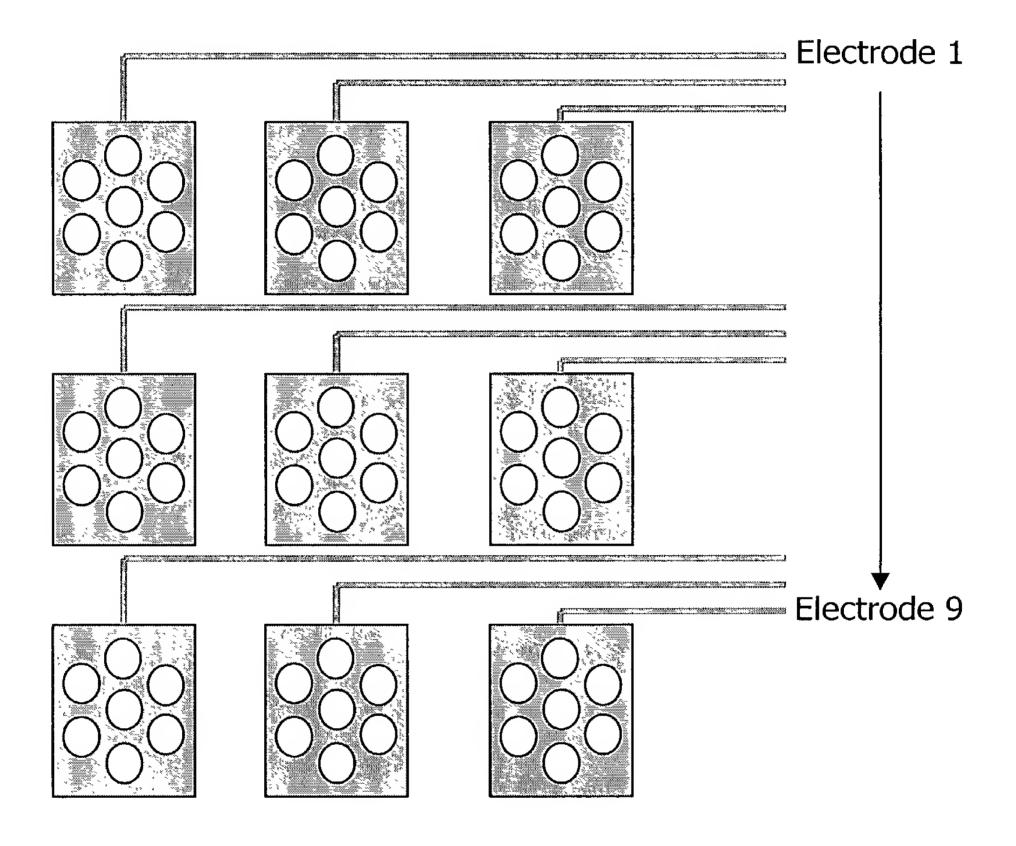
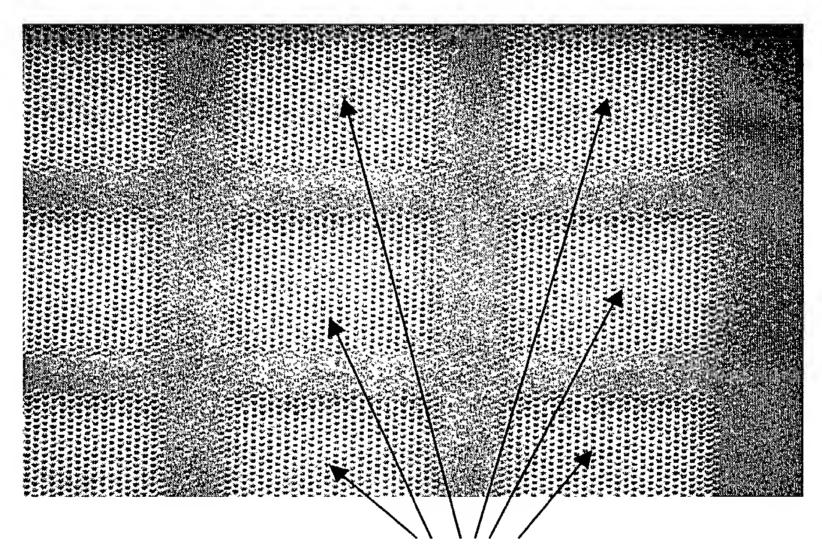


Figure 12



Separate electrode grating regions

Figure 13



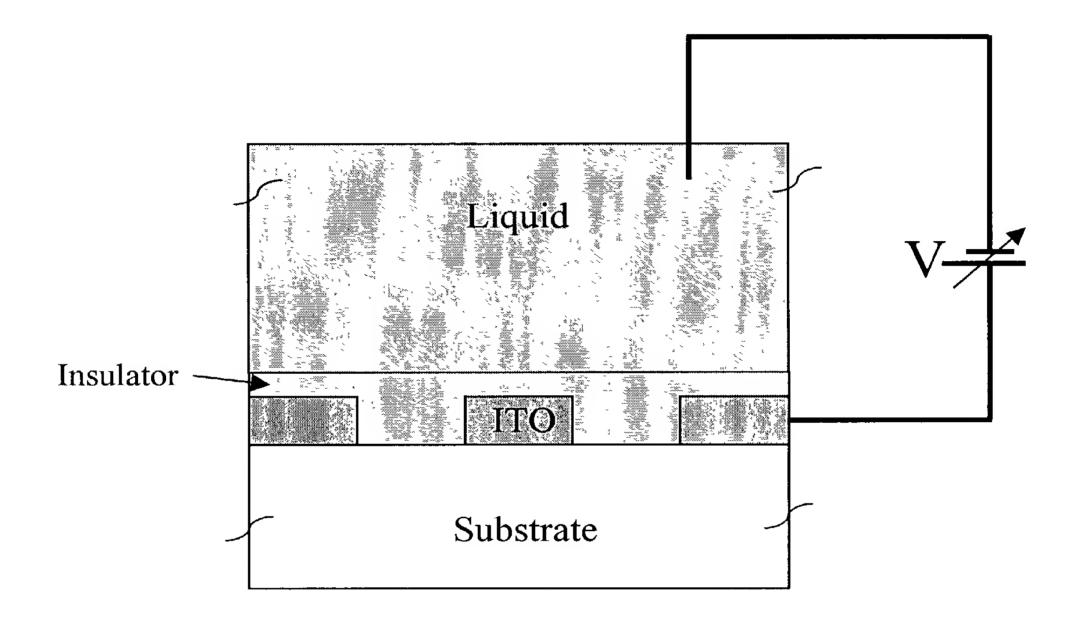


Figure 14



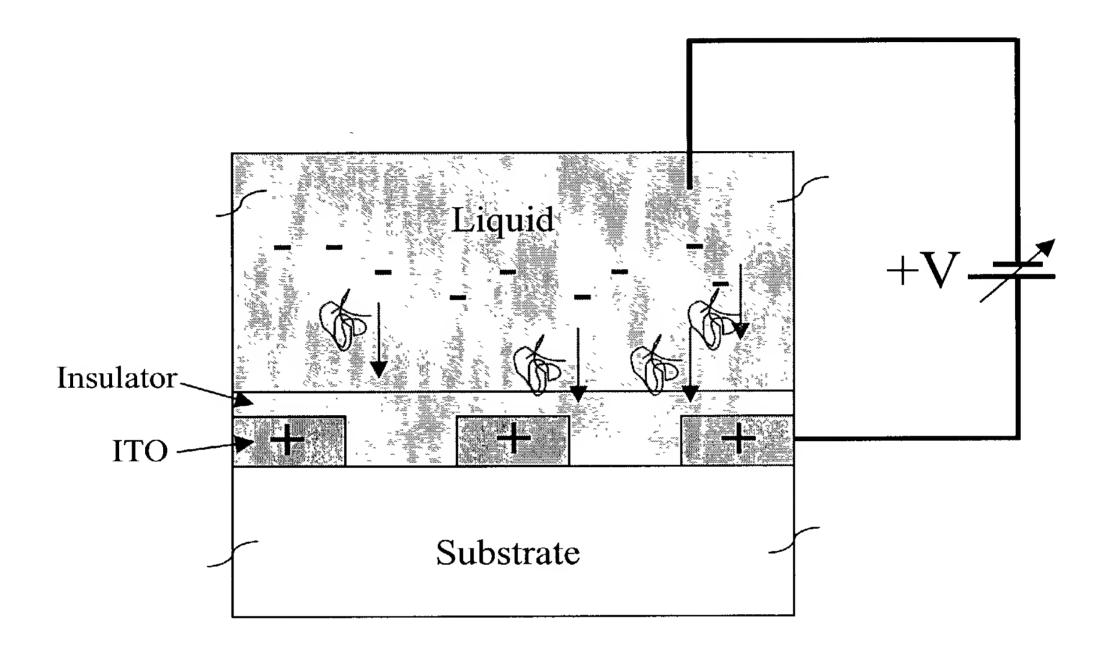


Figure 15

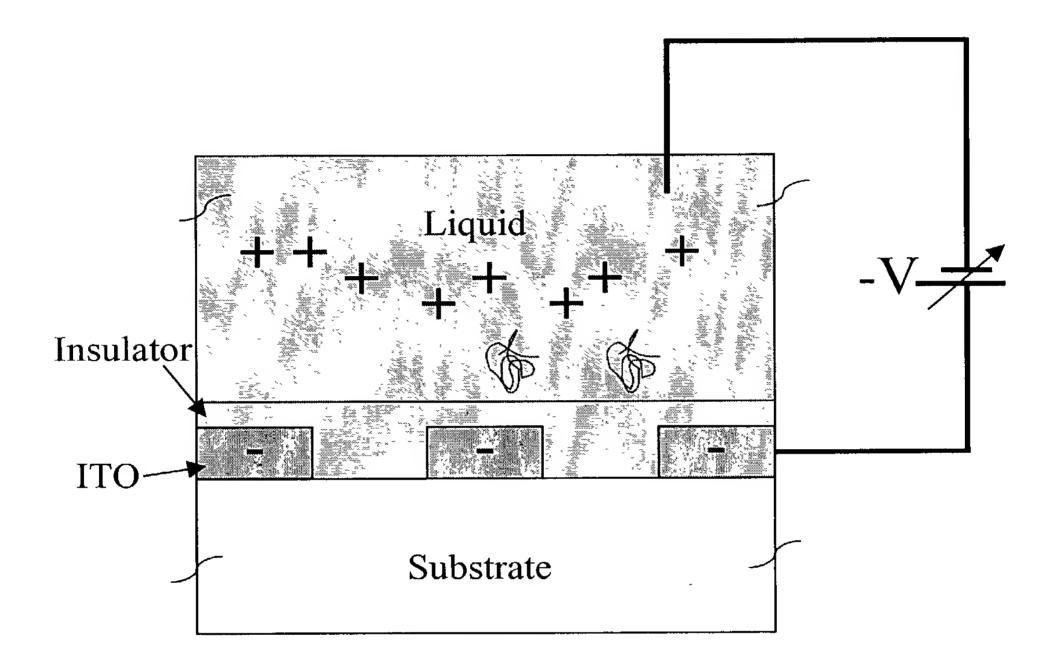


Figure 16



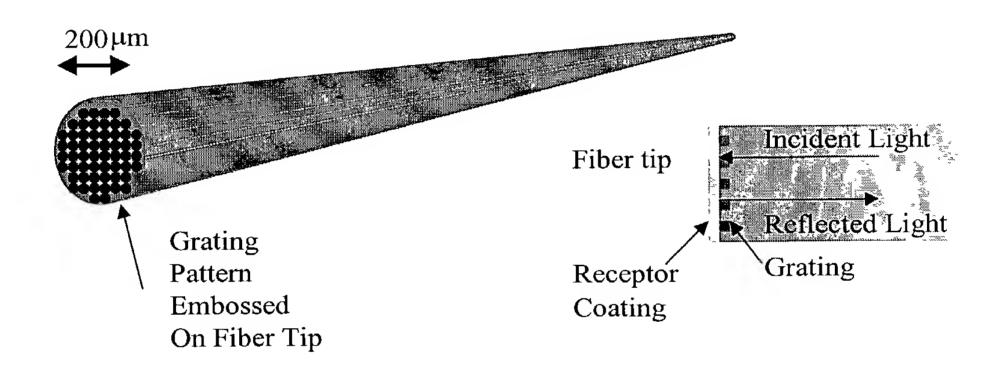


Figure 17



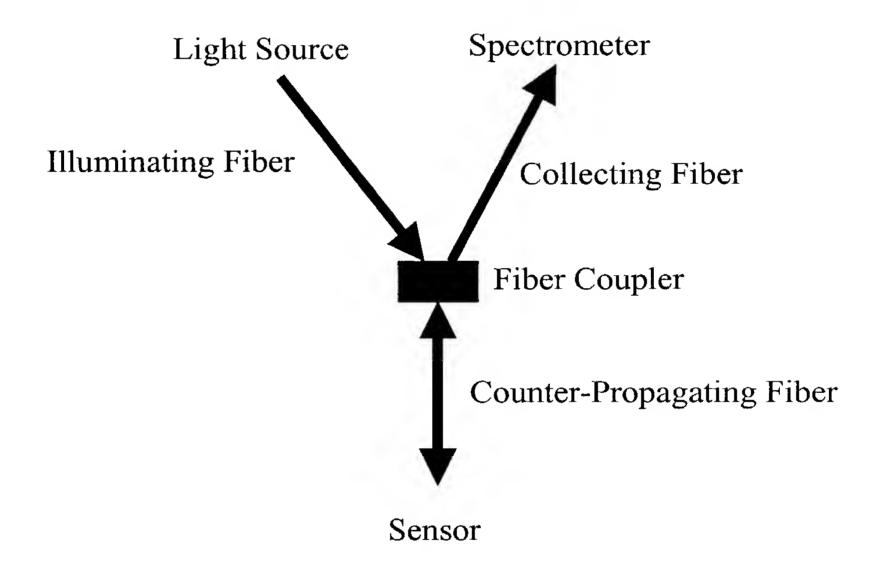


Figure 18



Peak Wavelength

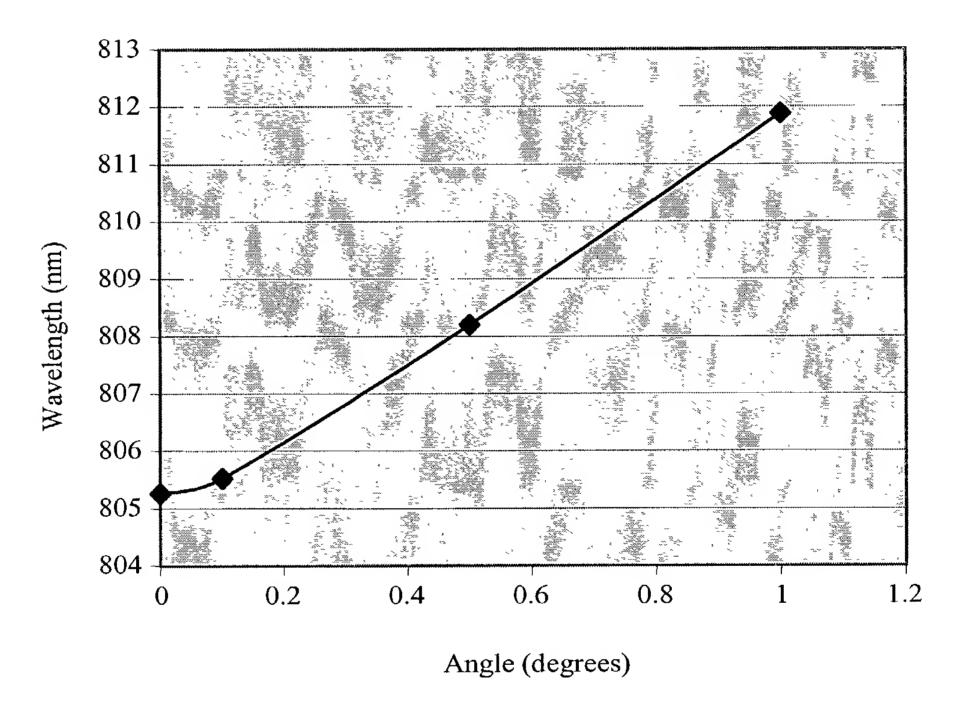


Figure 19



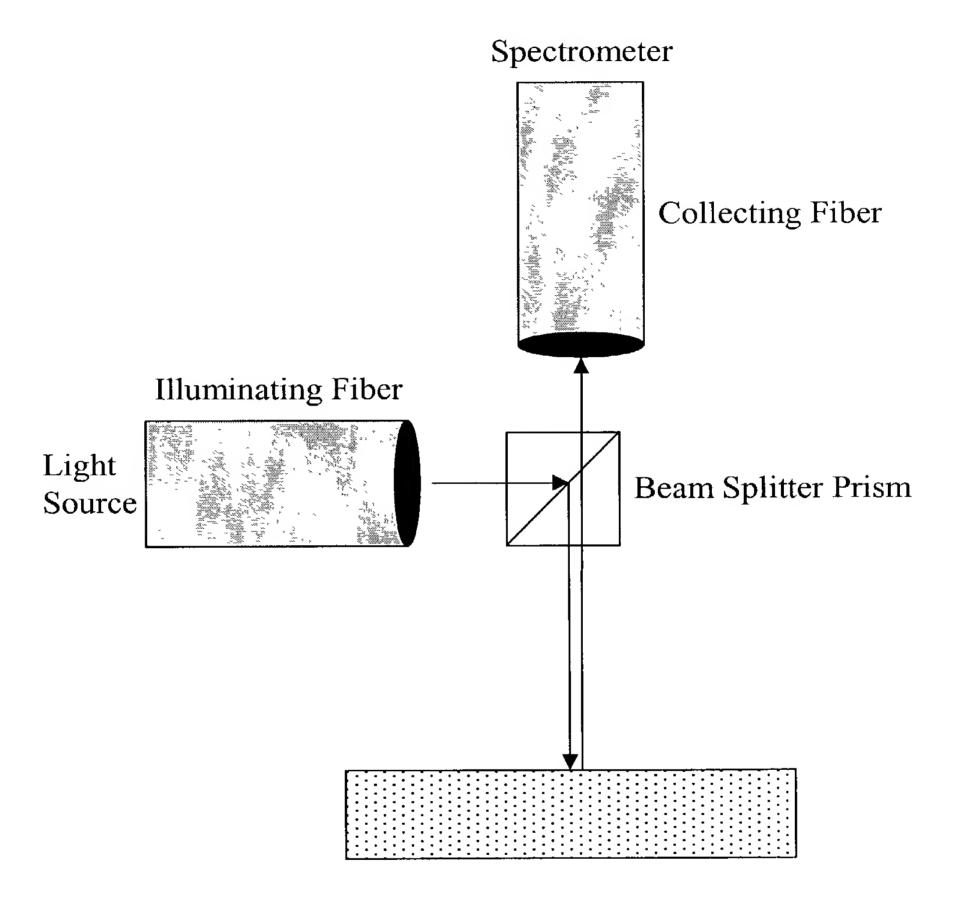


Figure 20



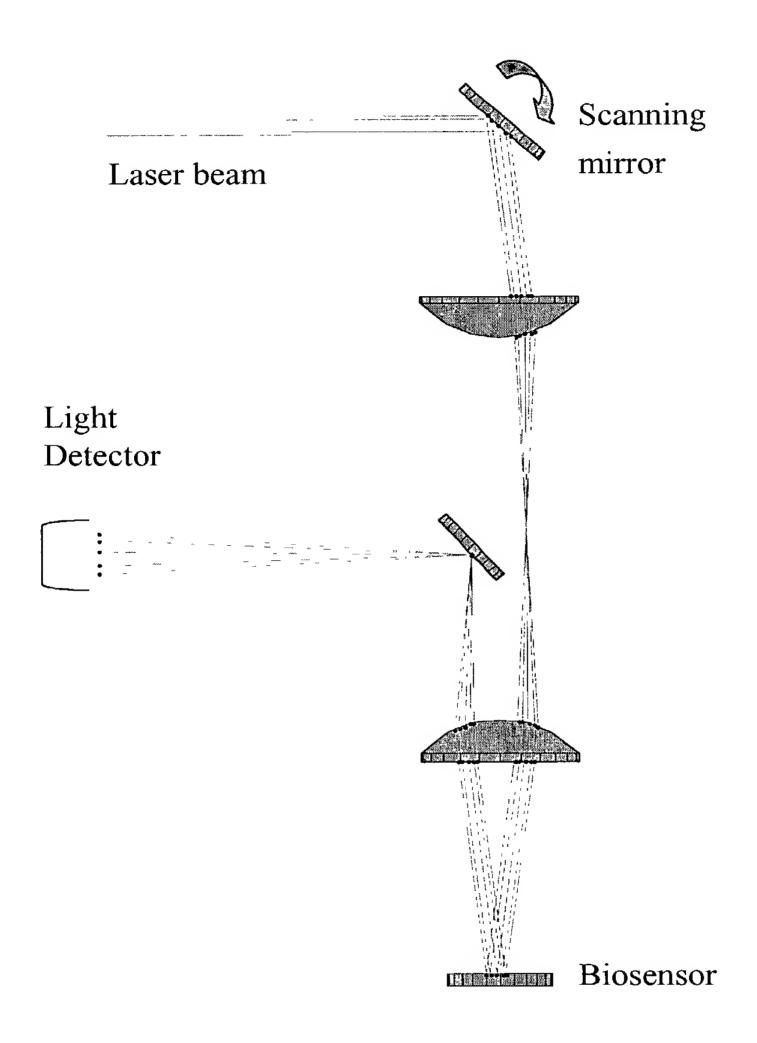


Figure 21

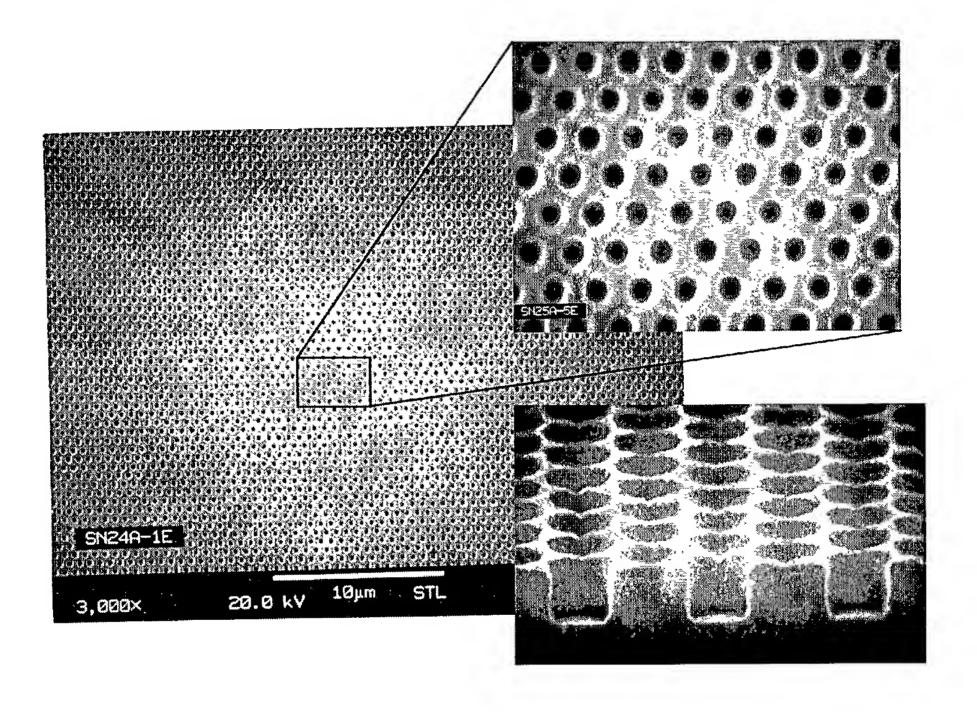


Figure 22



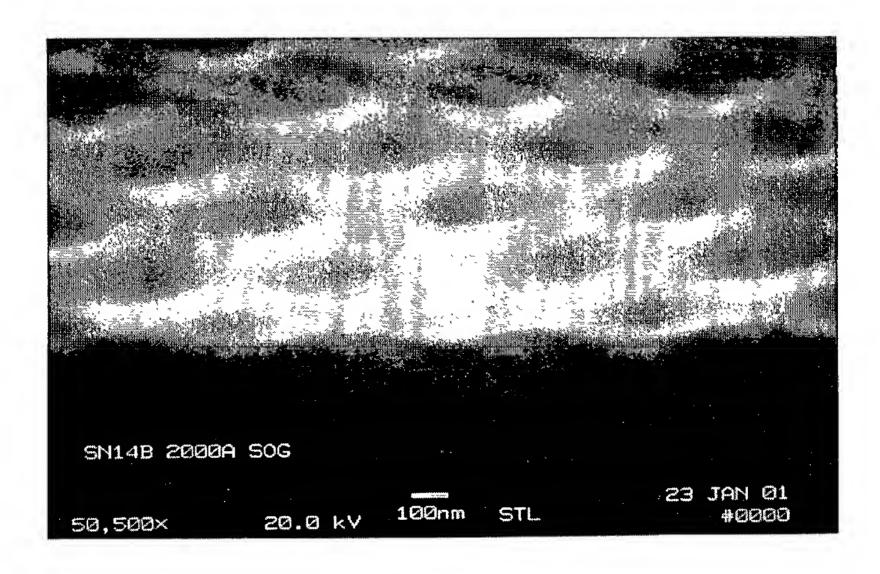


Figure 23



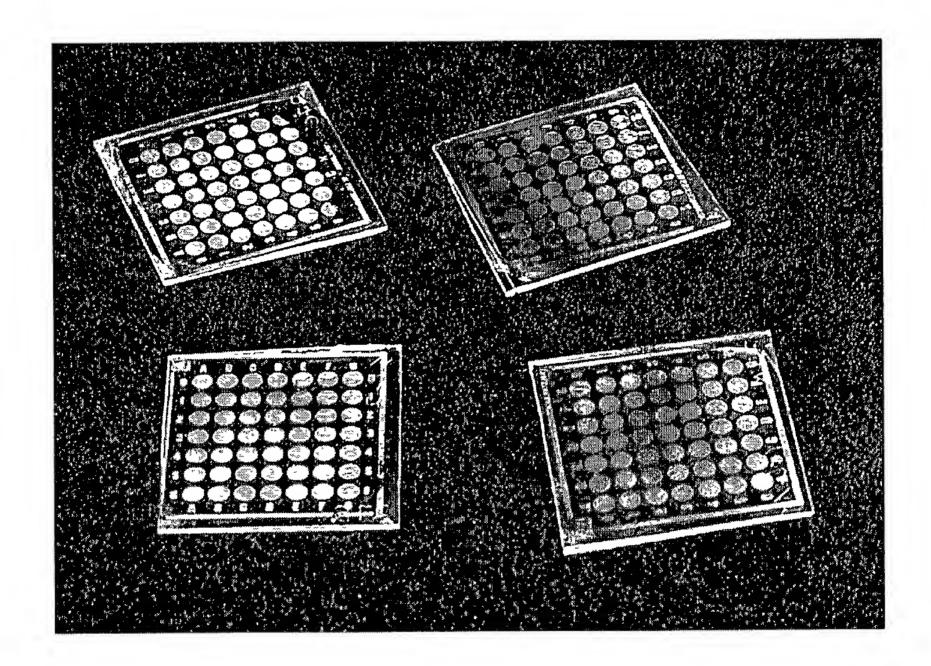


Figure 24



Albumin Deposition on Resonant Reflector

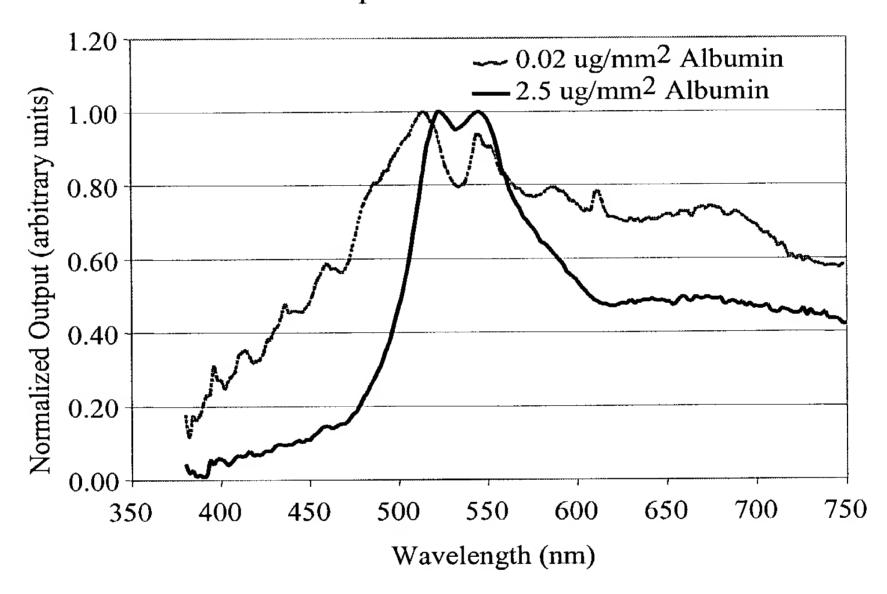


Figure 25



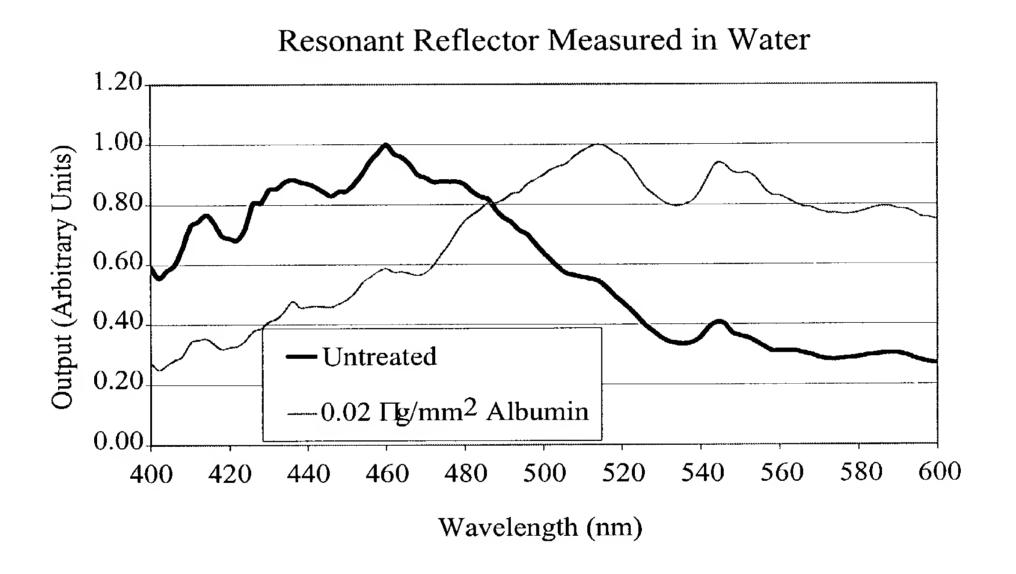


Figure 26



Bacteria immobilization on structure

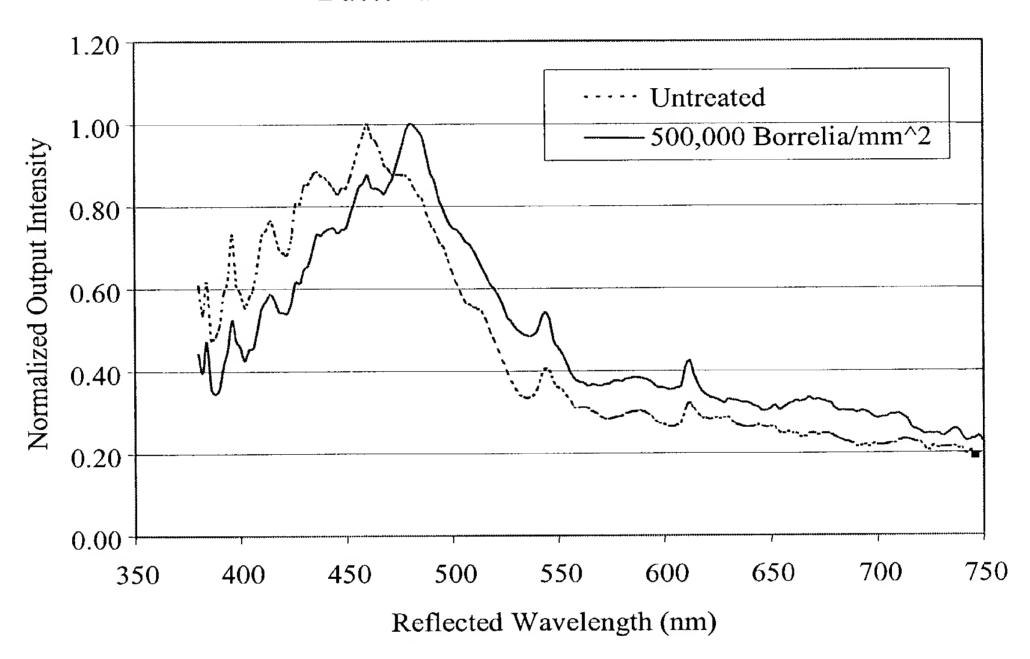


Figure 27



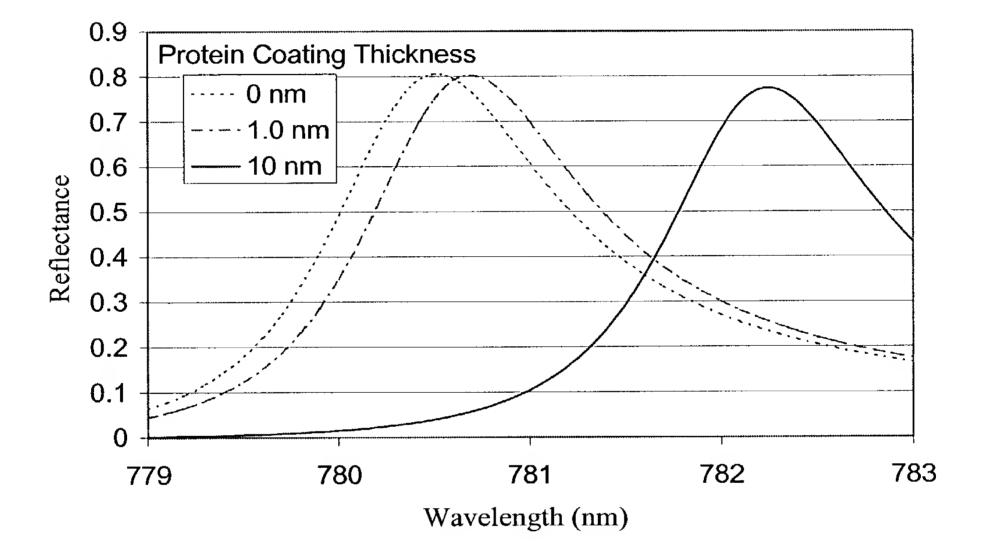


Figure 28



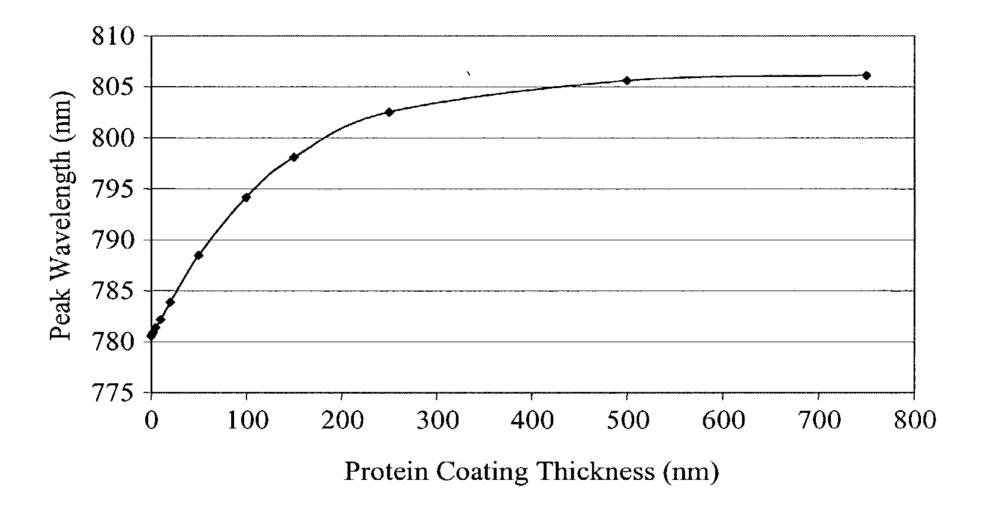
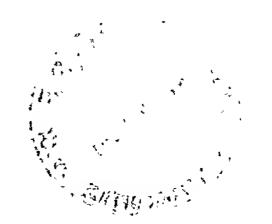


Figure 29



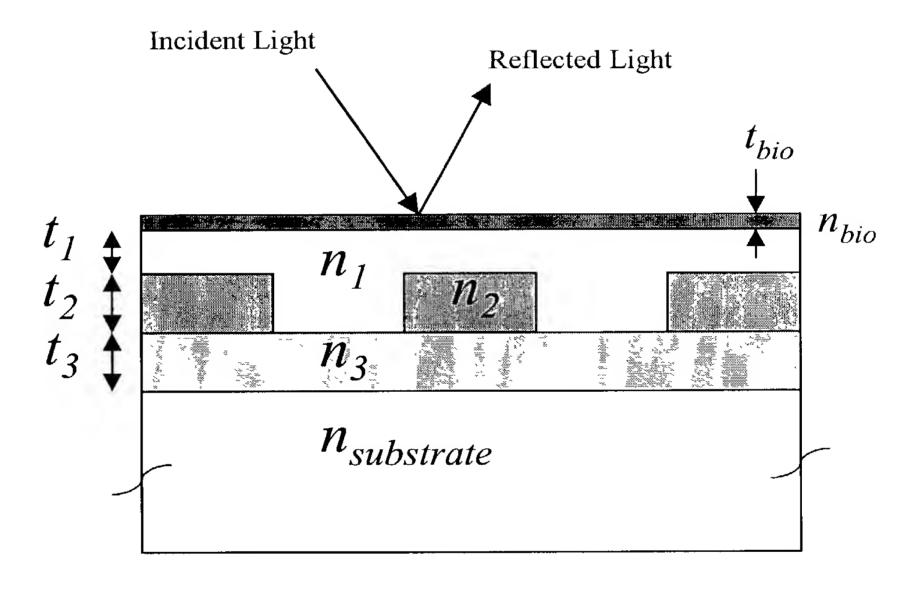


Figure 30

Reflected Resonance with Deposited Protein

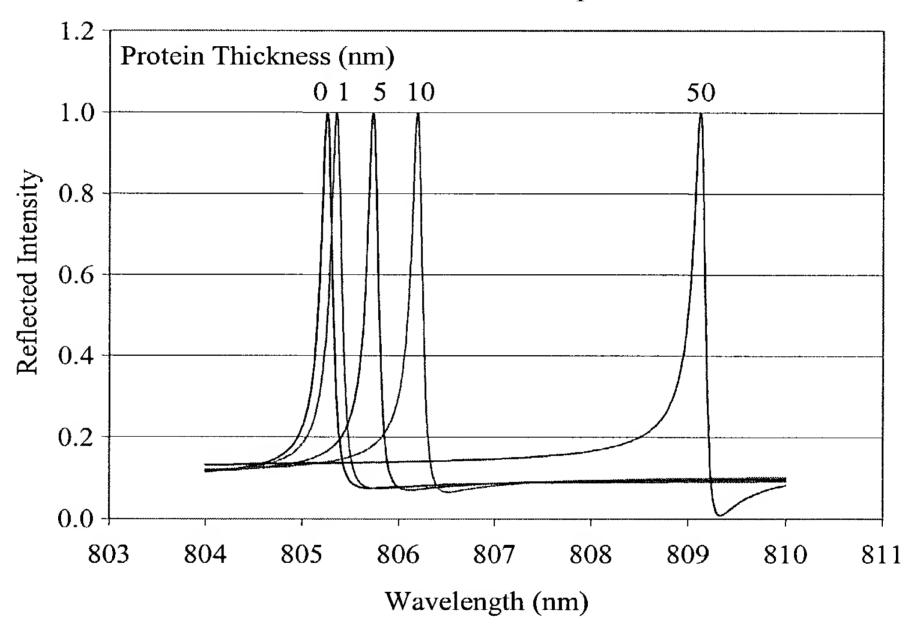


Figure 31



Resonant Peak Wavelength Dependence on Deposited Protein Thickness

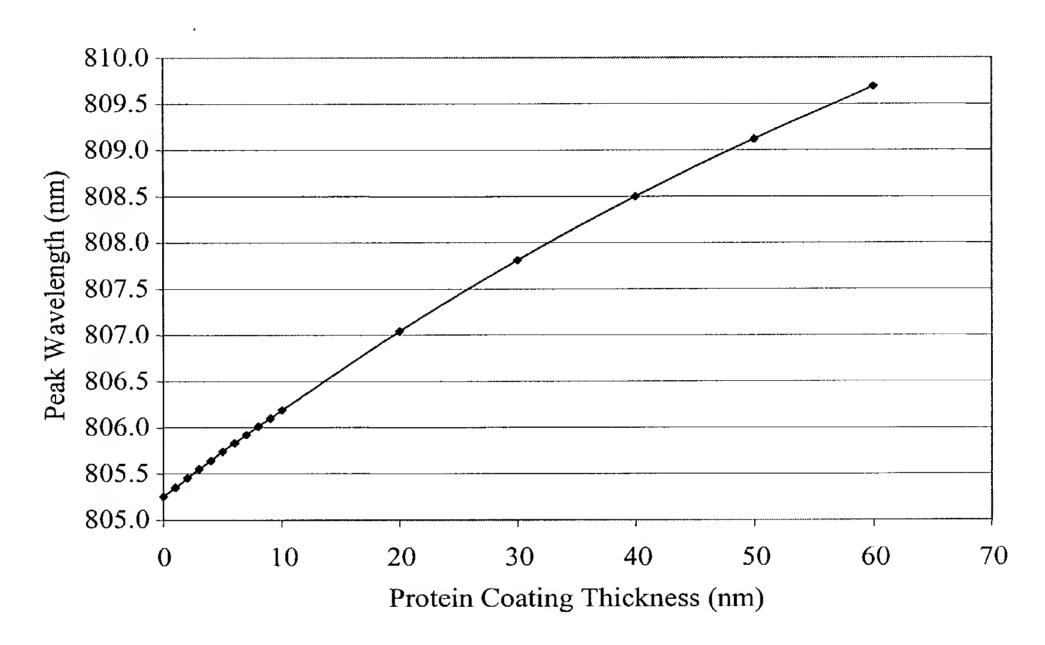


Figure 32



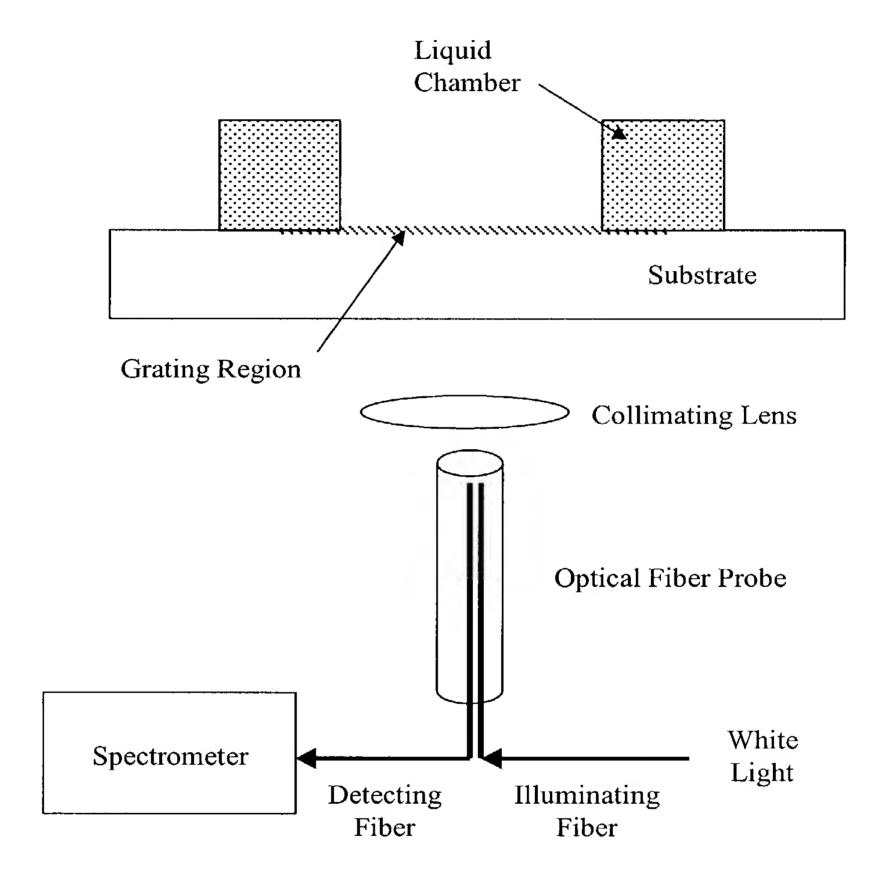


Figure 33



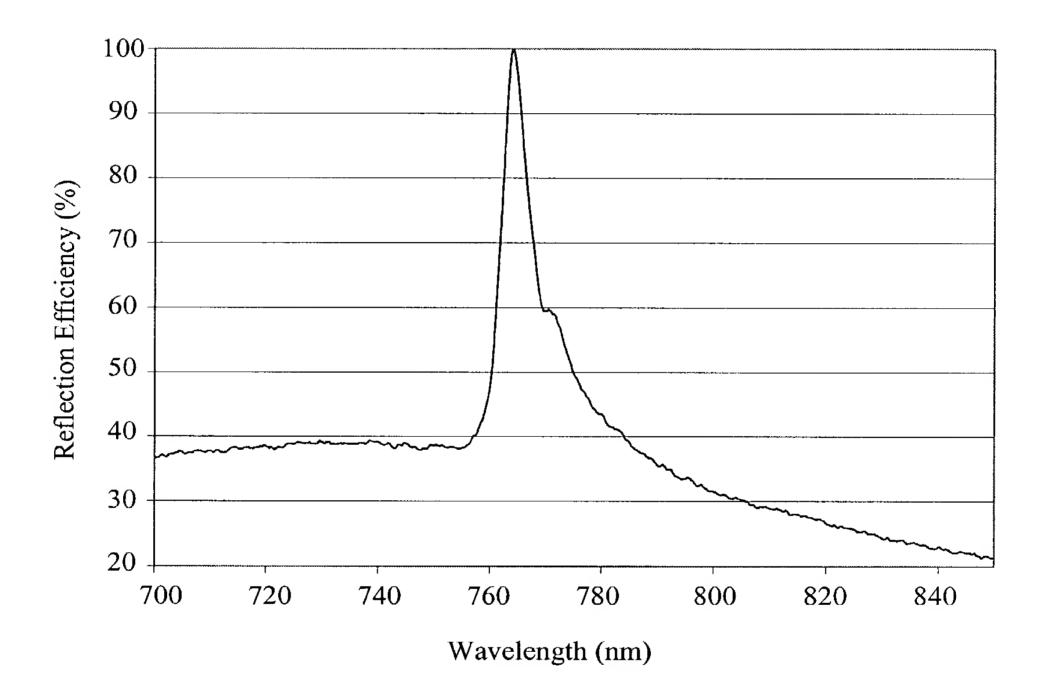


Figure 34

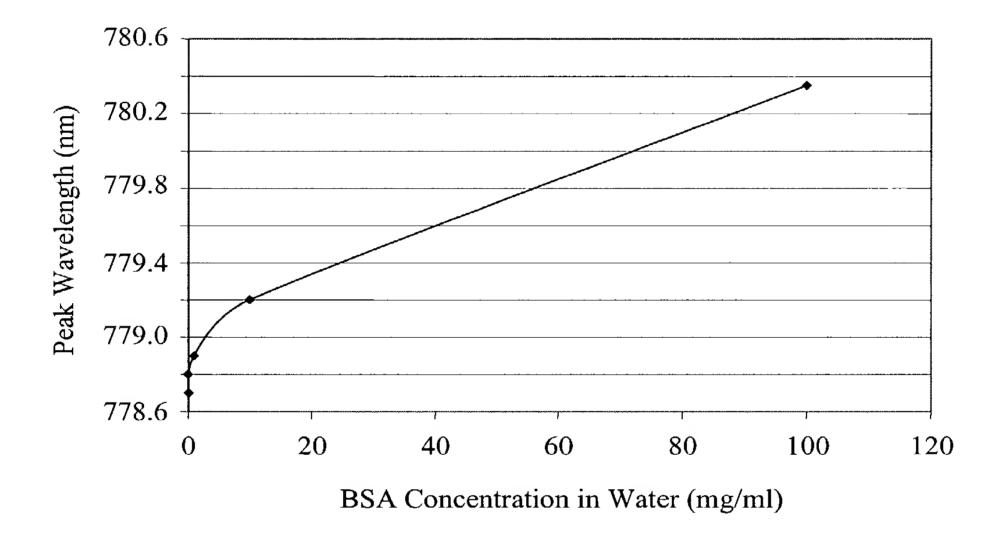


Figure 35



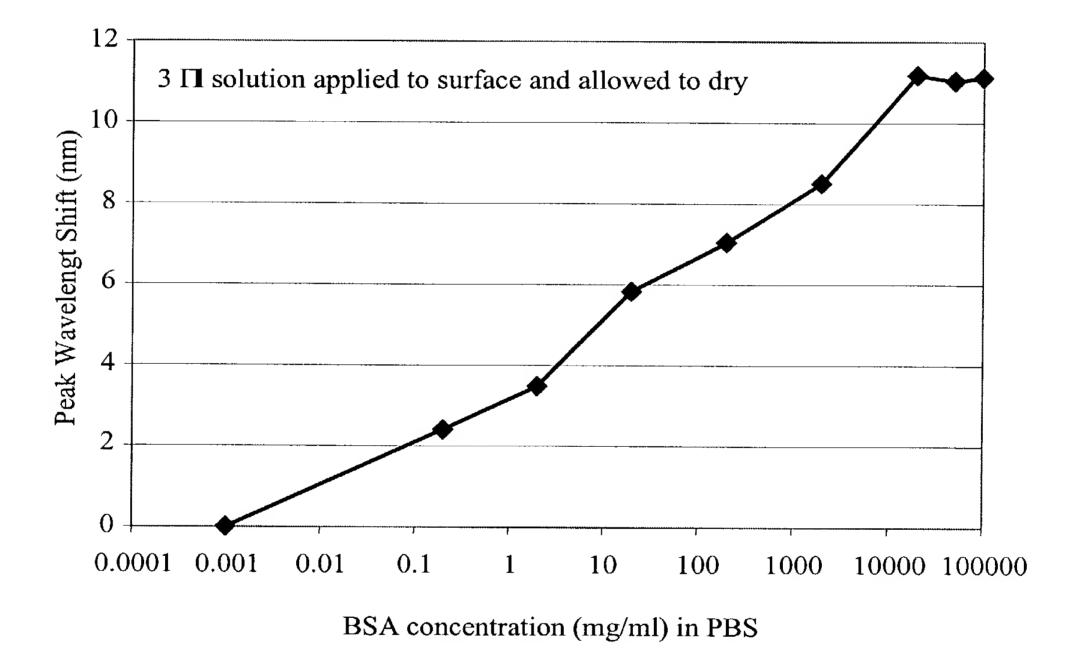
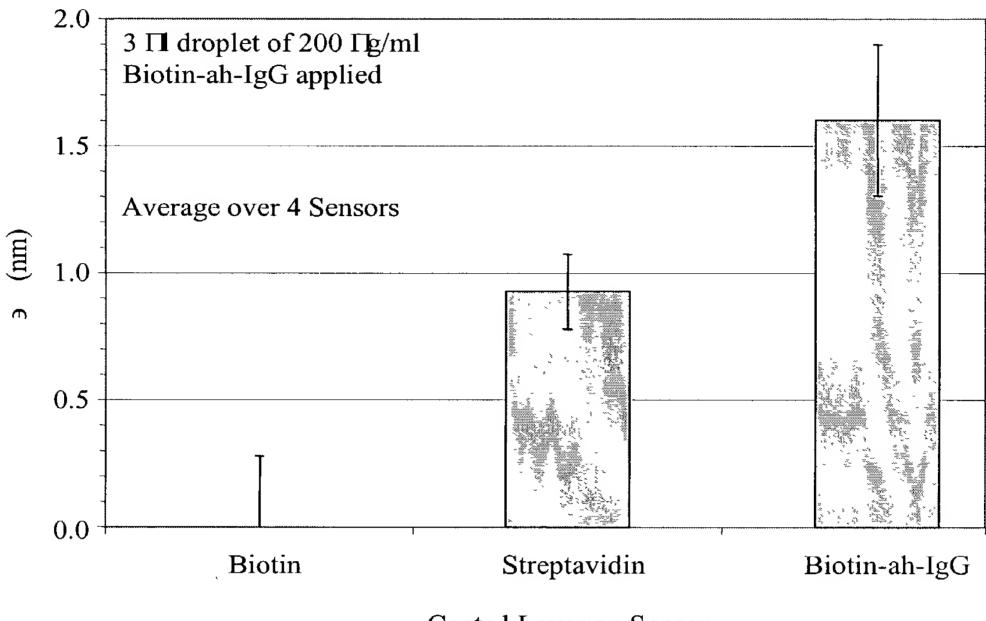


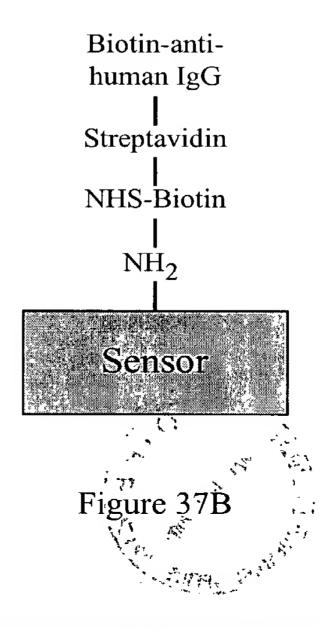
Figure 36





Coated Layer on Sensor

Figure 37A





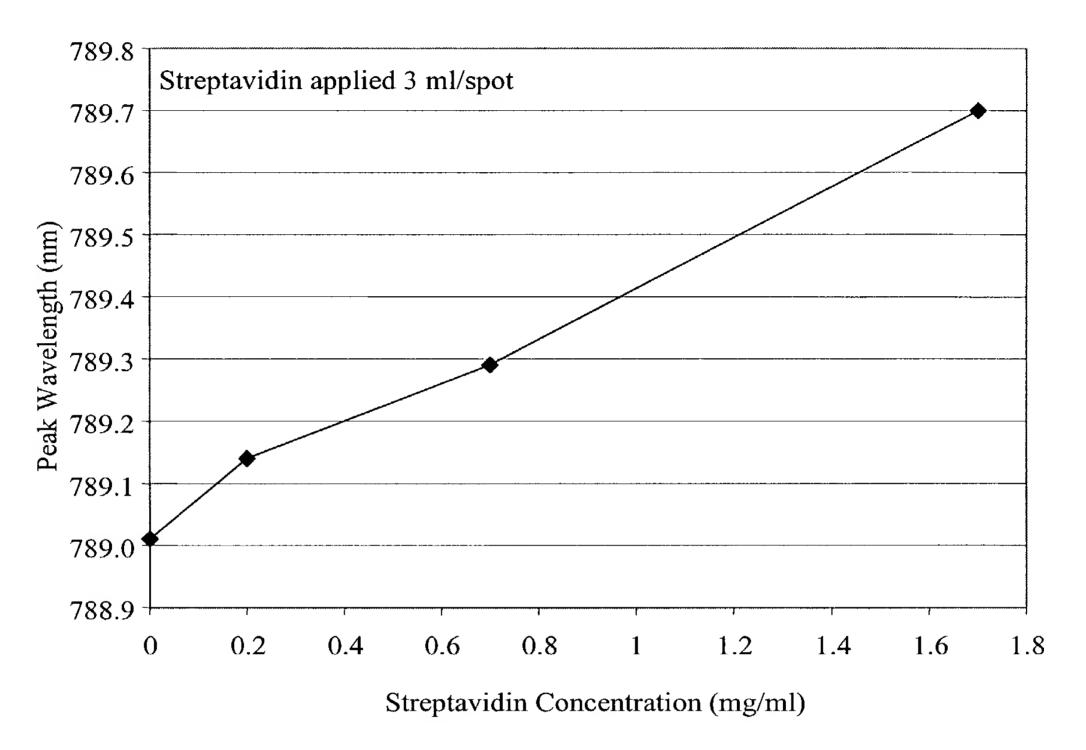
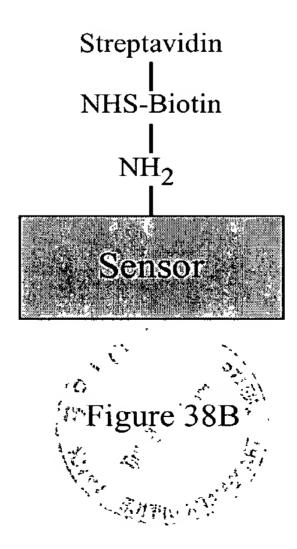
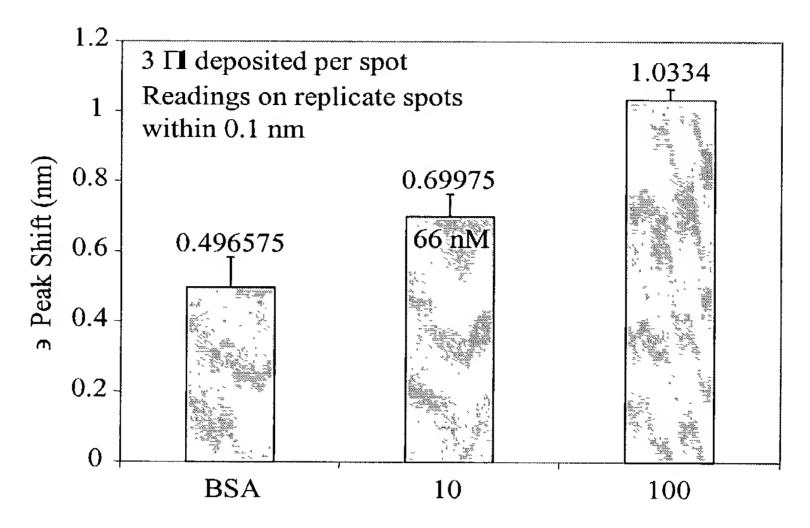


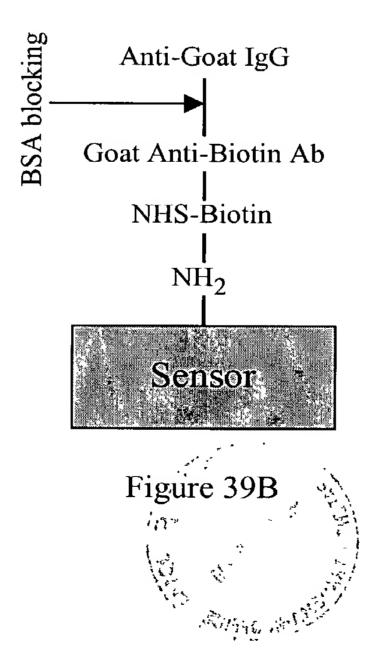
Figure 38A





Goat anti-biotin antibody (Πg/ml)

Figure 39A



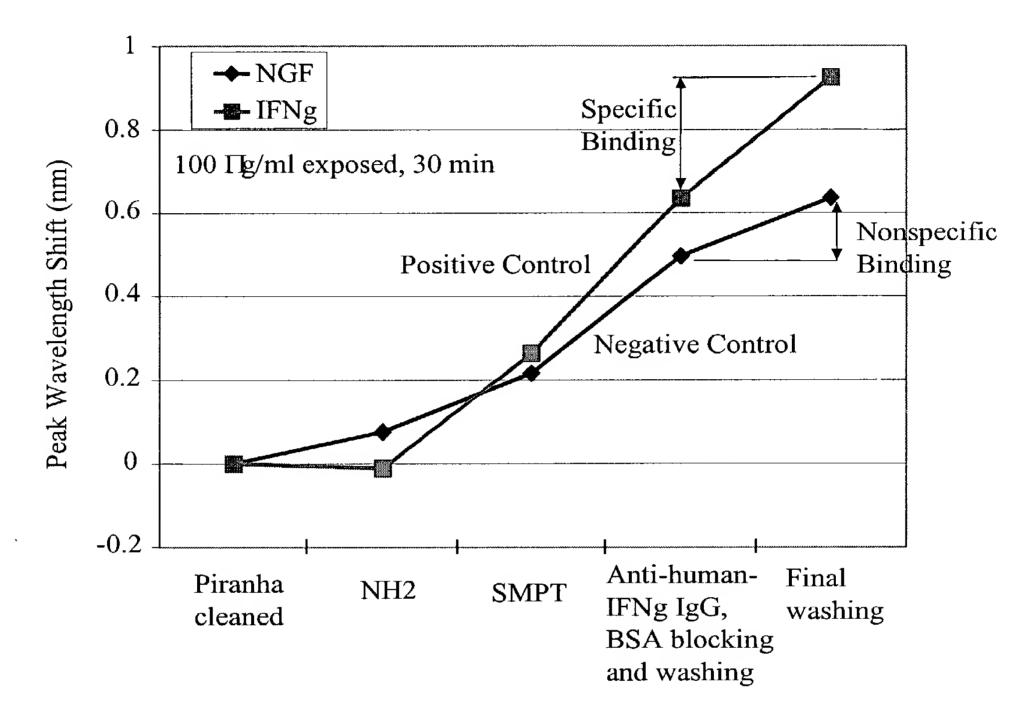
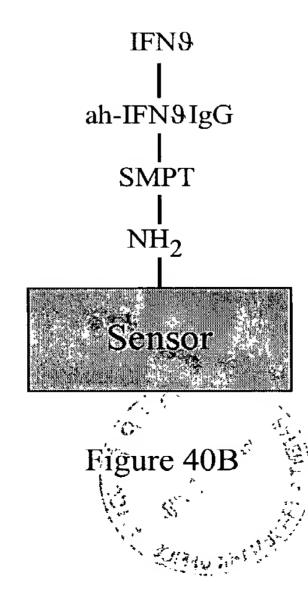


Figure 40A



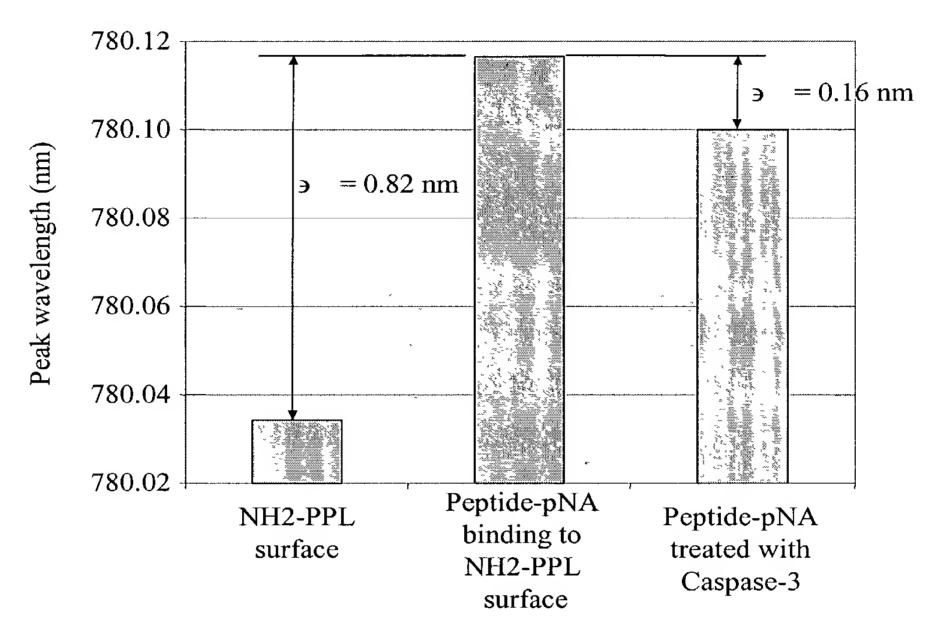
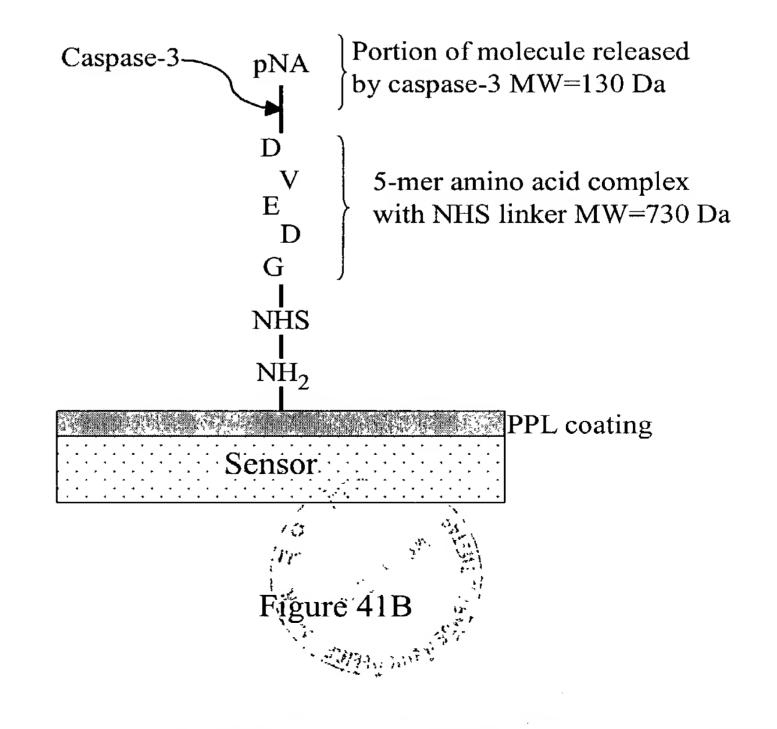


Figure 41A



Measured shifting of the resonant wavelength caused by the binding of various biomolecular layers.

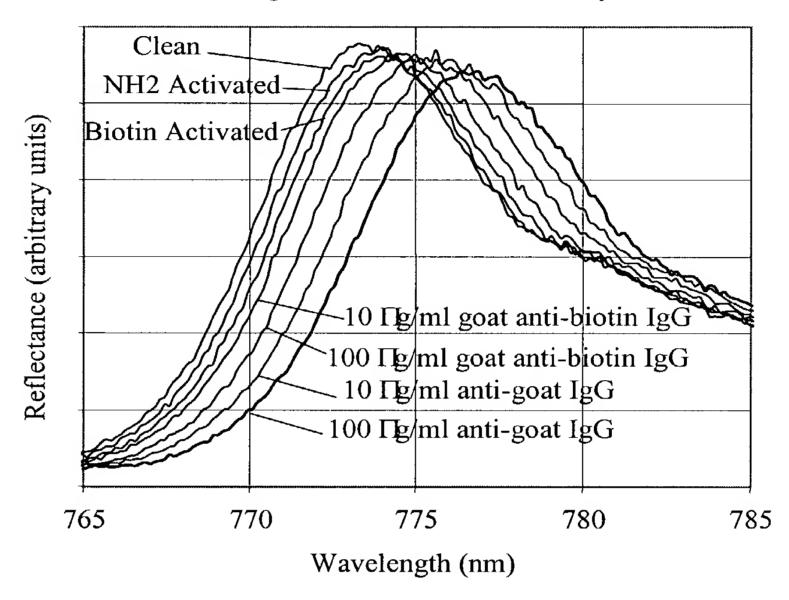
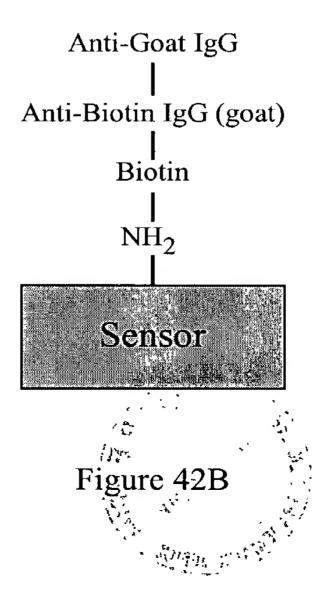


Figure 42A



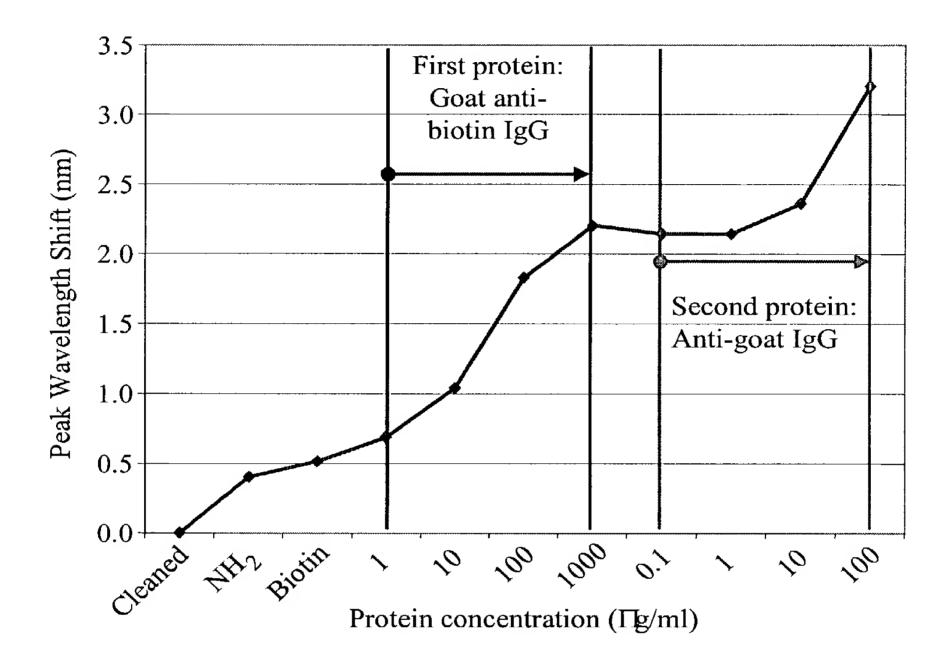
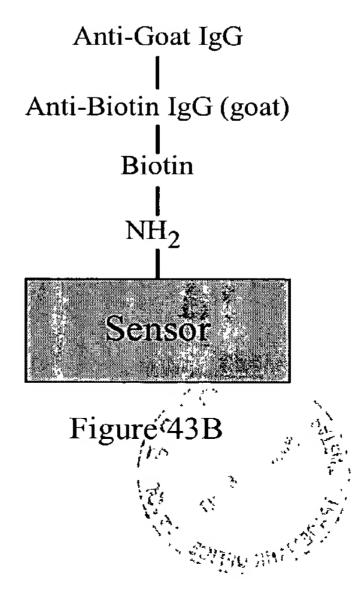


Figure 43A



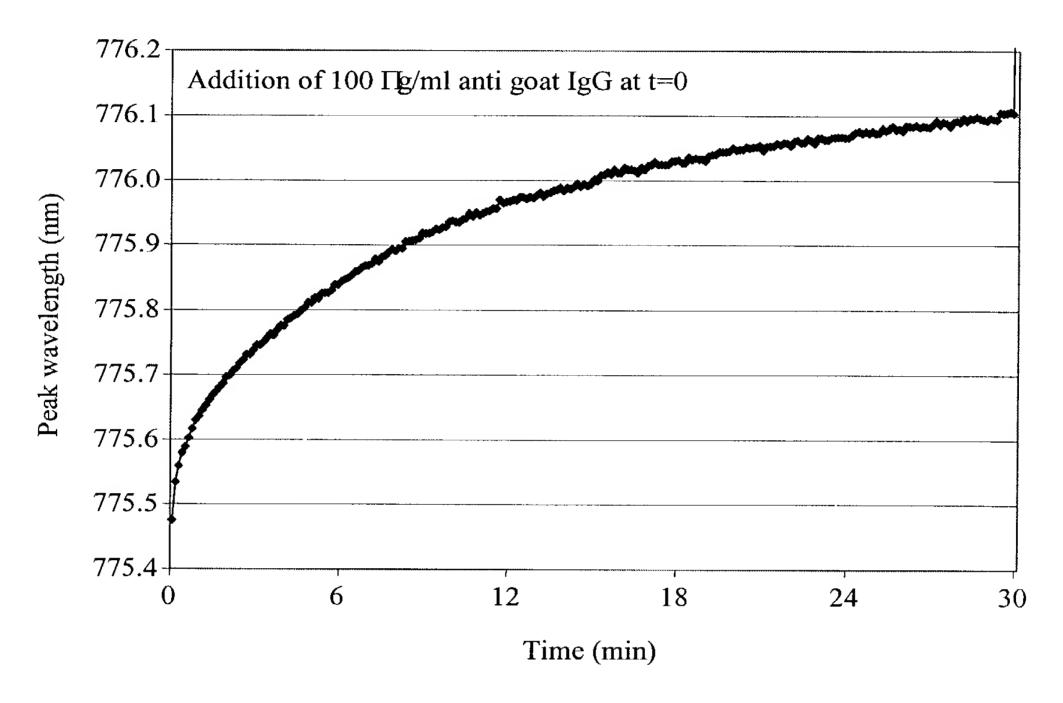


Figure 44A

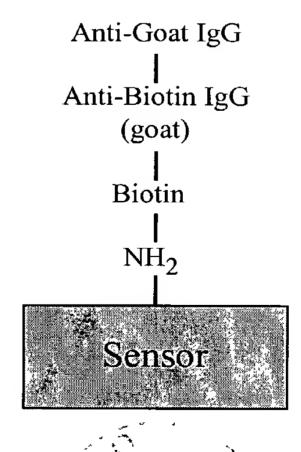


Figure 44B



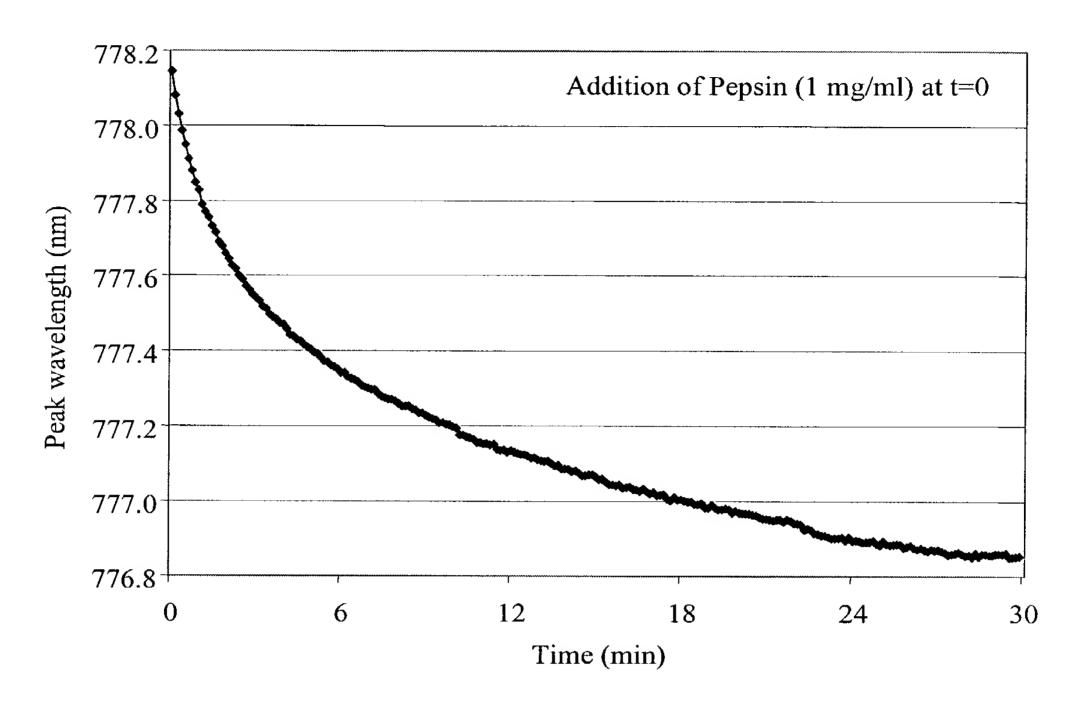
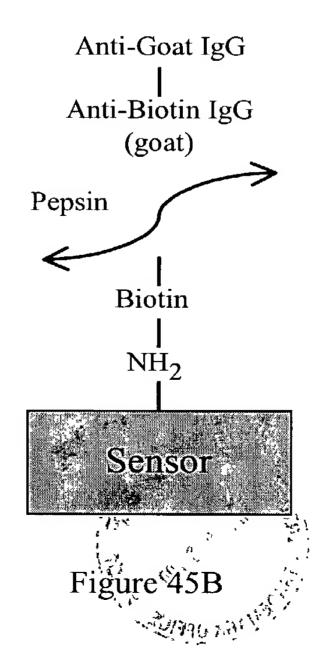


Figure 45A



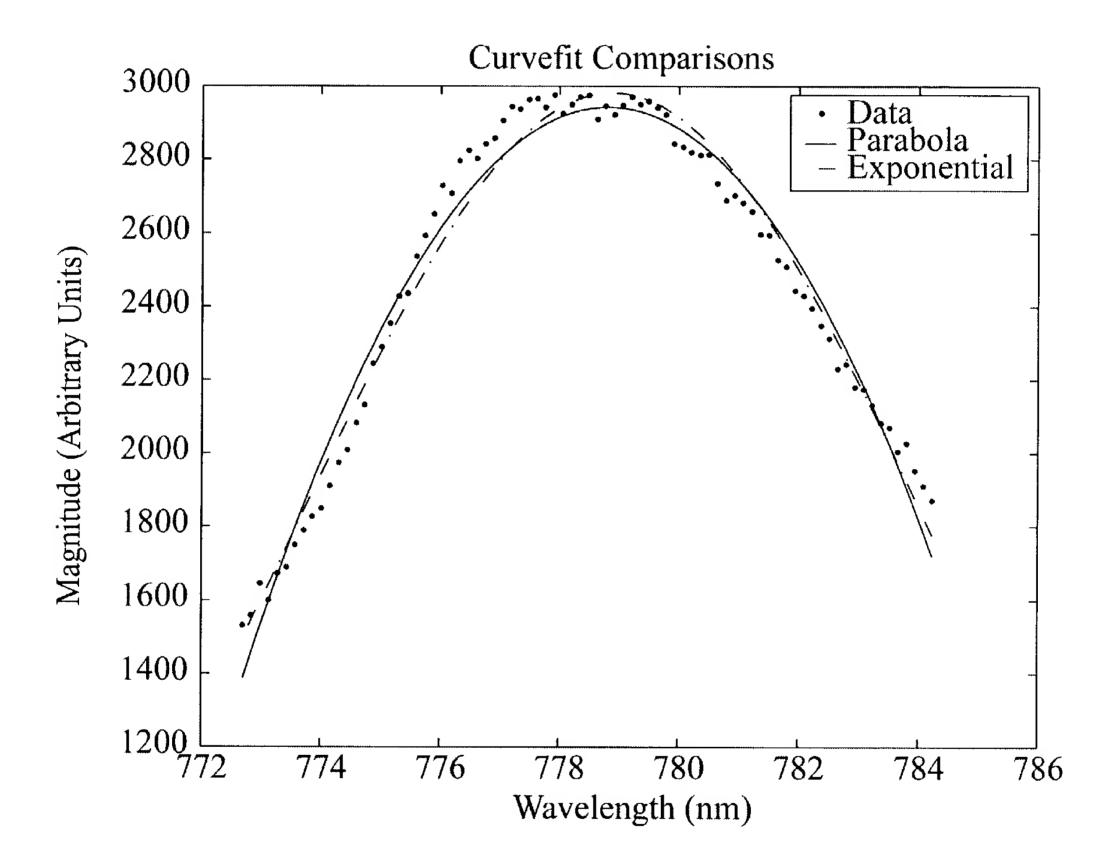


Figure 46



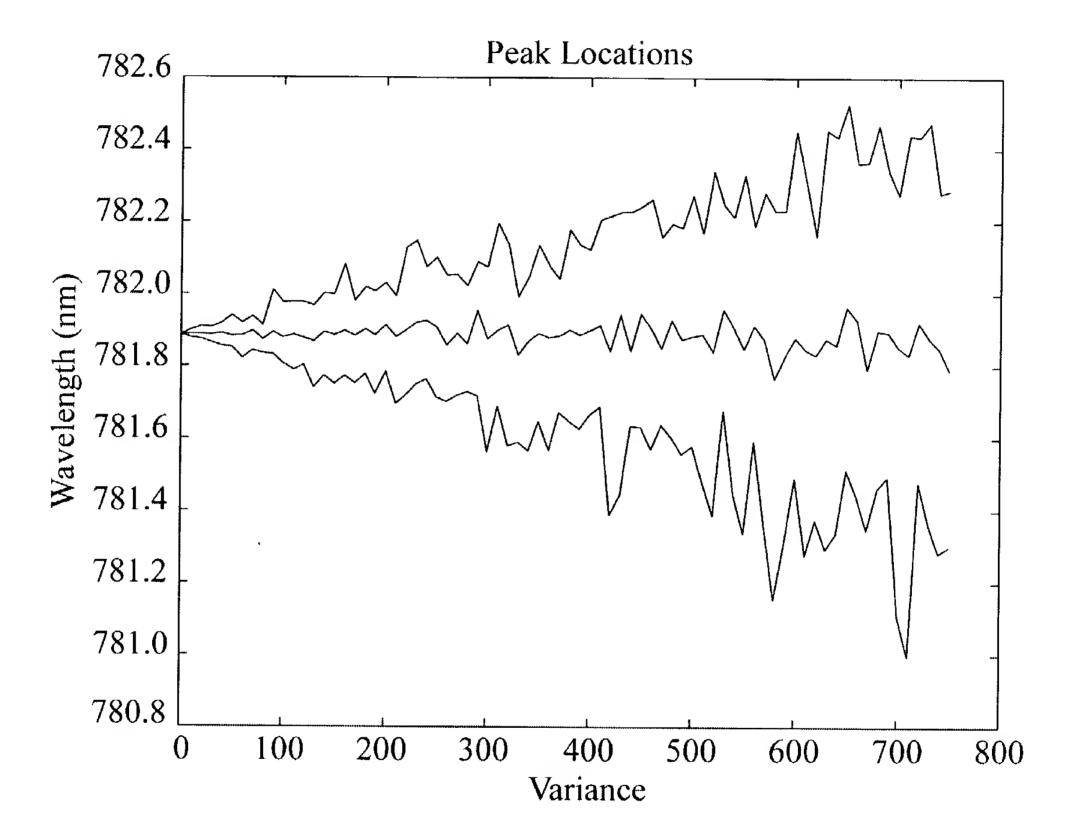
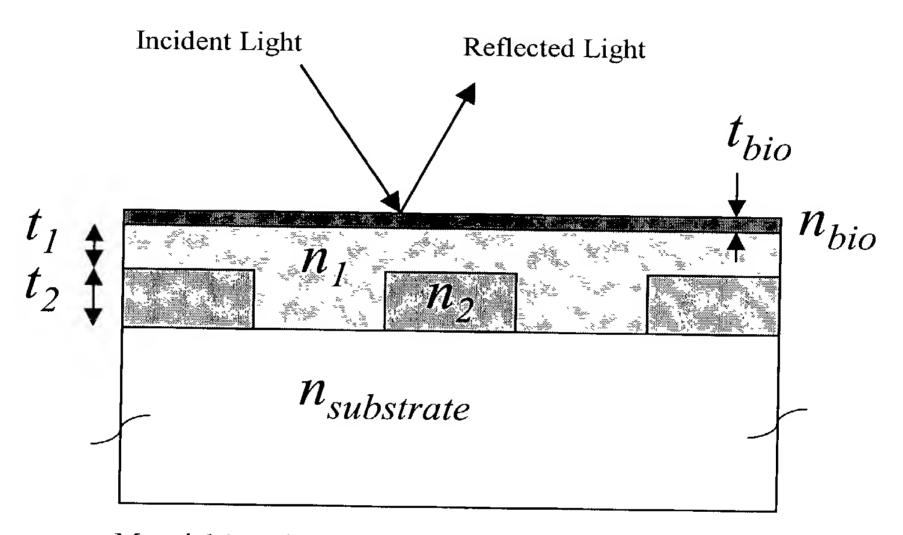


Figure 47





Material 1 = Electrical Insulator (photoresist, epoxy, glass)

Material 2 = Indium tin oxide conductor

Substrate = Glass

Figure 48

Concentric Circle Design

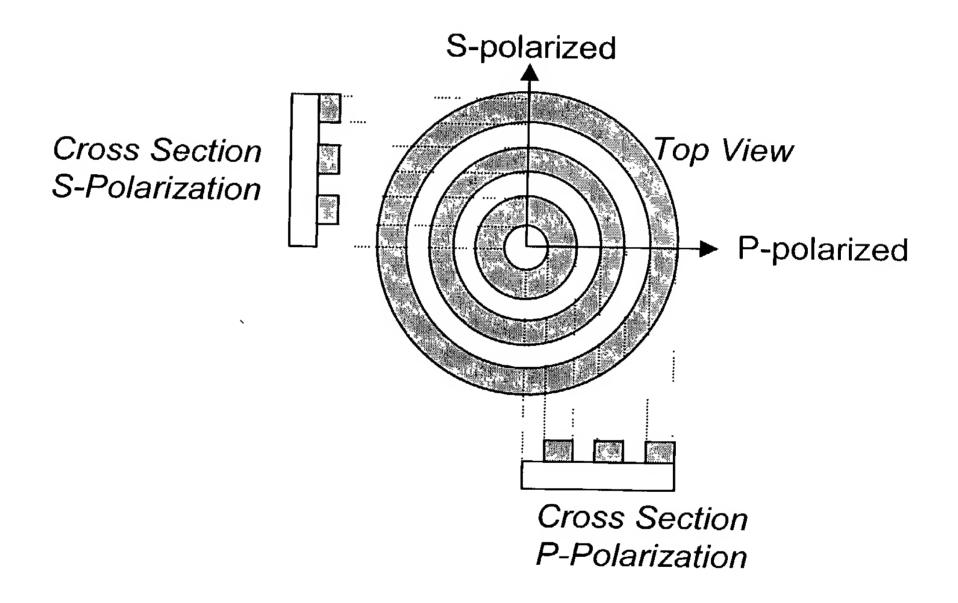


Figure 49



Hexagonal Grid Design

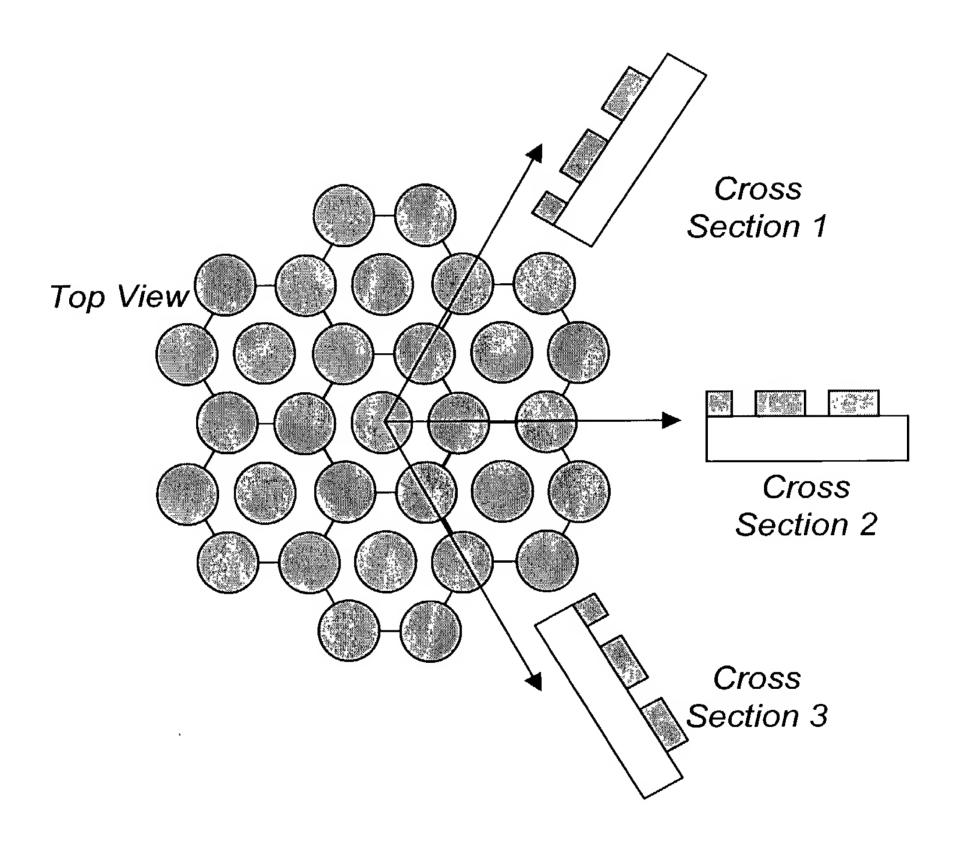


Figure 50



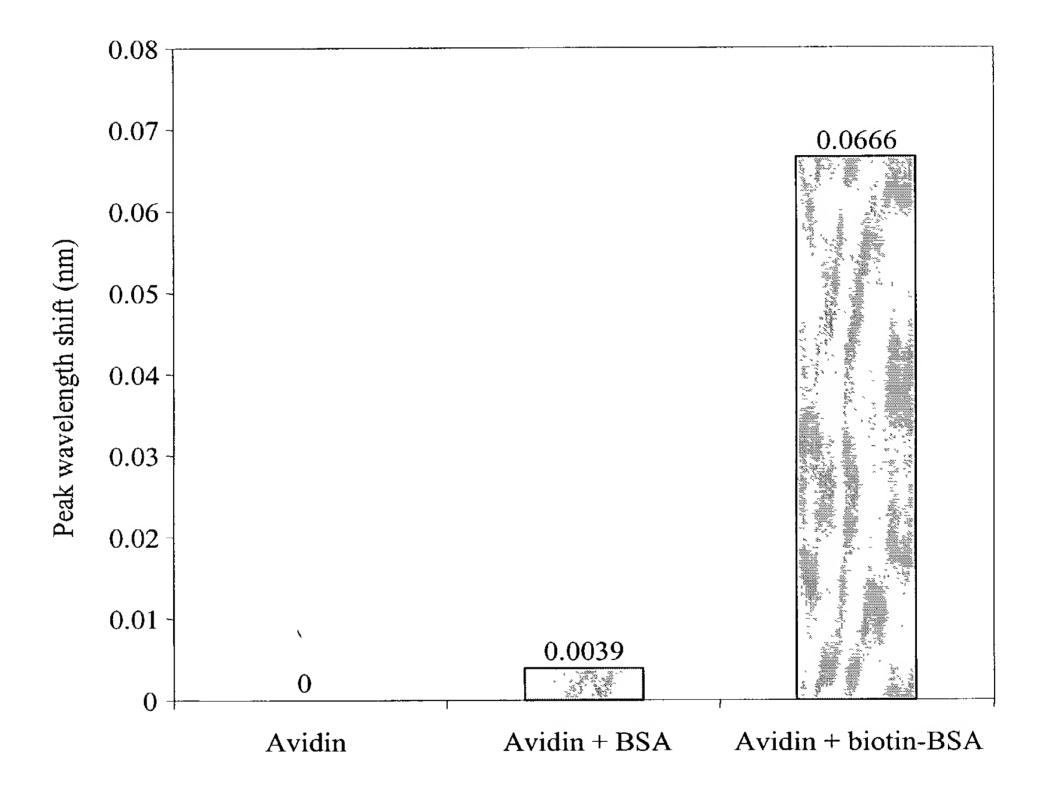


Figure 51



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